

# **The Whole is Greater than the Sum of its Parts: Predicting FTIC Enrollment**

By:  
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# **The Whole is Greater than the Sum of its Parts: Predicting FTIC Enrollment**

## **Abstract**

In an attempt to provide improved FTIC enrollment predictions, this study followed exploratory techniques seeking to differentiate yield rates among FTIC applicants based on one or more of the following source characteristics: Geographical Location, Single or Multiple Institution applications, Race/Ethnicity and Sex, High School GPA, Admissions Test Scores.

Based on historical yields of admits among the various possible groupings and interactions of the preceding variables, a set prediction techniques was developed and tested on historical cohorts. Error analyses showed that global prediction techniques were between 1.5 and 5 times more efficient than more detailed approaches. Three global techniques were applied, with very small error differences among them for fall or summer semesters.

## **Executive Summary**

In an attempt to provide improved FTIC enrollment predictions, this study followed exploratory techniques seeking to differentiate yield rates among FTIC applicants at the University of South Florida (USF), a major metropolitan university, based on one or more of the following source characteristics:

- Geographical Location
- Single or Multiple Institution applications
- Race/Ethnicity and Sex
- High School GPA
- Admissions Test Scores

Based on historical yields of admits among the various possible groupings and interactions of the preceding variables, a set prediction techniques was developed and tested on historical cohorts. Error analyses showed that global prediction techniques were between 1.5 and 5 times more efficient than more detailed approaches. Three global techniques were applied, with very small error differences among them. Most analyses were conducted separately for fall and summer semesters (spring samples were simply too small).

## **Primary Findings**

In all the following, yields represent the percentage of admitted students that enrolled at USF according to the SUS Master Admissions Files.

- The most recent yields best predict the following year's yields for each semester (these can only be used for global analyses due to sample size limitations).
- Three global methods produced prediction error rates across five years of between 1.5% and 2.5%: (1) yield of all admits, (2) yield of admits within seven geographical groups, (3) yield of admits within seven High School GPA categories.
- Generally, percentages of applicants across all five of the variables listed at the top, remain reasonably stable over time and within groups.

All of the following effects are subsumed within Global projections:

- Substantial yield differences occur from different geographical sources (see Table 4).

- A precipitous decline occurs between yields of those who apply only to USF (57%) and those who apply to at least one other SUS institution (32%) - see Table 2 for details. Yields continue to decline as the number of applications increases.
- An interaction occurs between applying to one or multiple institutions and High School performance (as measured by GPA and Test Scores). Yields for those applying to only USF are similar for students having a 2.5 and for those having a 4.0 GPA. This effect holds true across different geographical areas. However, among those applying to more SUS institutions than just USF, yields drop consistently as High School performance scores increase (see Figure 5, Figure 6, Table 13, Table 14).
- Table 2 shows that students applying to more than one institution are more likely to be admitted to USF (circa 80%) than are those who apply to USF alone (circa 70%). Also, lower academic qualifications increases the probability of a student applying only to USF (Table 7).
- Although no yield differences occur between sexes, almost all minority group admits exhibit higher yield rates than white admits (Figure 1).
- Table 9 suggests that greater percentages of NonUSA USF applicants are applying to multiple SUS institutions today than in past years. Although this may be a trend, it may also reflect a short-term fluctuation, because, the numbers in this group (circa 100 annually) are small enough to make even slight variations falsely appear important.
- Only 43% of fall applicants apply to only USF, while 53% of summer and 87% of spring applicants do so (Table 6). Further, summer applicants are most likely (58%) to have a GPA from 2.5-3.0 (Table 8). Students with lower academic credentials are more likely to be admitted during the summer term (Figure 4).

## Recommendations

It appears that the use of prior year's geographical location may be the most efficient predictive approach due to less variability than GPA groups, which could also be used. The gain over a total cohort method for either of these is about two-tenths of one percent. This gain may not be worth the effort. Appendix A displays the most recent fall and summer semester yields within groups. The most difficult task will be predicting total admits early in the admissions process (before mid March). Once that can be reasonably estimated, a reasonable estimate of fall enrollments becomes possible, subject, of course, to the limitations noted below.

Regarding scholarship offerings, these data suggest that 75% of USF's non-service area Florida applicants apply to at least one other SUS institution. Offering scholarships to desired students from this group would put us into direct competition with our SUS competitors (see Table 5 for details).

Change current used for weekly admissions projections to use only the most recent year. The current technique uses an average of the most recent three years.

## Limitations and Relevant Factors Relating to Data

Any projections made using the techniques recommended here must be based on an estimate of future admits. Such estimates may be considerably in error.

All of the factors investigated, plus many others, interact among themselves and influence yields for any given year. Therefore, any number of factors may cause substantial changes

in yield rates among specific sub-populations of applicants. Therefore, any estimates should be viewed as a range rather than a specific yield percentage.

The yield estimates used in this study are final yields. Yields may differ among groups of applicants from different times. For example, preceding fall applicants may differ significantly in their intentions from spring or summer applicants to the next fall semester. This may add substantial error to projections.

In addition to the many other factors that influence FTIC yield, if competitor institutions change their behaviors, as they did in the fall 1999 (Micceri, 1999), this may substantially alter yields.

Please note that numbers from table to table will not add up, because different selection criteria were applied during different phases of the research. The final analyses include only data from summer 1996 to fall 1999, only for the Tampa or St. Petersburg Campus locations and each individual applicant was included once, whether or not they applied during more than one semester. spring term data are not included in any of the final outputs.

# Designing and Evaluating Prediction Methods for FTIC Enrollment

## Introduction

In an attempt to provide improved FTIC enrollment predictions, this study followed exploratory techniques seeking to differentiate yield rates among FTIC applicants based on one or more of the following source characteristics:

- Geographical Location
- Single or Multiple Institution applications
- Race/Ethnicity and Sex
- High School GPA
- Admissions Test Scores

By evaluating historical yields and trends therein, we hope to be able to better estimate probable yields among various combinations of the preceding factors. Estimated differential yields may then be applied to specific sub-populations in weekly admissions records to better estimate probable future incoming cohorts.

Historical research at USF (Micceri, 1998; Micceri, 1997) indicates that substantial yield differentials occur among USF applicants relating to the following three factors:

1. Geographical Location - Local sources, especially Hillsborough and Pasco counties, show much higher yields than more distant locations.
2. Application to a single institution or more than one institution - The yield of single institution applicants is far greater than the yield of multiple institution applicants. Approximately 55% of USF's FTIC applicants apply to at least two SUS institutions.
3. Academic Qualifications - The yield of applicants having better academic qualifications in the form of high school GPA and test scores is somewhat lower than is the yield of those having lower academic qualifications, with the yield of alternative admits being greatest. This factor relates strongly to both items #1 and #2 above.).

## Methods

### Admissions Characteristics

The study attempted to identify consistent yield rate differences among FTIC applicants based on one or more of the following source characteristics:

- Geographical Location
- Single or Multiple Institution applications
- Race/Ethnicity and Sex
- High School GPA
- Admissions Test Scores

Analyses of historical yields and trends between and among these primary variables were conducted separately by semester.

Based on yields of admits, locations were broken into the seven groups listed below. All of these numbered at least 1,000 admits during the four year period used for the fall semesters, except for the non-USA group (about 400).

Approximate	Geographical Location (see Table 10 for details)
60%	Highest yield counties (Hillsborough, Pasco, etc.)
46%	High yields (Pinellas, Manatee, etc.)
38%	Slightly lower yields (Polk & Sarasota)
31%	Somewhat lower yields (Brevard, Collier & Lee)
25%	Other Florida Counties
24%	Non-Florida USA locations
35%	Non-USA locations

These were then broken out separately by the number/percent in High School GPA groups (2.0-2.5, 2.5-3.0, 3.0-3.5, 3.5-4.0, >=4.0)

This number of groups necessitates limiting the number of categories and requires the use of multiple years to create reliable estimates. Small sample sizes (for example, fewer than 100) are extremely unreliable.

Although analyses suggested that yields did not differ between sexes, but did among racial ethnic groups, in all cases, breaking any groups into appropriate racial/ethnic subgroups resulted in samples that were far too small to use for these purposes.

### Variable Sources

Data came from SUS Master Admissions files from spring 1996 to spring 2000.

### Limitations

All of the factors investigated, plus many others, interact among themselves and influence yields for any given year. As a result, any number of factors may create substantial changes in yield rates among specific sub-populations of applicants. Therefore, any estimates should be viewed as a range rather than a specific yield percentage.

The yield estimates used in this study are final yields. Yields may differ among groups of applicants from different times. For example, preceding fall applicants may differ significantly in their intentions from spring or summer applicants to the next fall semester. This may add substantial error to projections.

In addition to the many other factors that influence FTIC yield, if competitor institutions change their behaviors, as they did in the fall 1999 (Micceri, 1999), this may substantially alter yields.

Numbers from table to table will not add up, because different selection criteria were applied during different phases of the research. The final analyses include only data from summer 1996 to fall 1999, only for the Tampa or St. Petersburg Campus locations and each individual applicant was included once, whether or not they applied during more than one semester. Spring term data are not included in any of the final outputs.

## Results and Discussion

### Cohort Characteristics

Please note that numbers from table to table will not add up, because different selection criteria were applied during different phases of the research. The final outputs include only data from summer 1996 to fall 1999, only for the Tampa or St. Petersburg Campus locations and each individual applicant was included once, whether they applied during more than one semester. Spring term data are not included in the final outputs.

In the following, yield represents the percentage of admitted students that enrolled at USF according to the SUS Master Admissions Files for a subset of the spring 1996 through spring 2000 cohorts.

### A Search for Trends

Table 1 shows that for summer semester cohorts, the yield of both applicants and admits has remained remarkably consistent, with only the summer of 1997 differing by any substantial amount. However, data for the fall semesters suggests that, while specific trends may not be present, considerable variability occurs from year to year in yields for the entire cohort. We know that some of this relates to competitor actions (Micceri, 1999). Some sub-groups may prove less variable, but the gap between the lowest (1997) and the highest (1999) for both all applicants and among admits is approximately 5%. Considering that 5% of 6,000-7,000 admits is 300-350 enrollees makes apparent the importance of this variability. Further, every year saw at least a 2% change from the preceding year. This variability indicates that averages across several years may produce smaller estimation errors than any attempt to create trend analyses.

**Table 1**

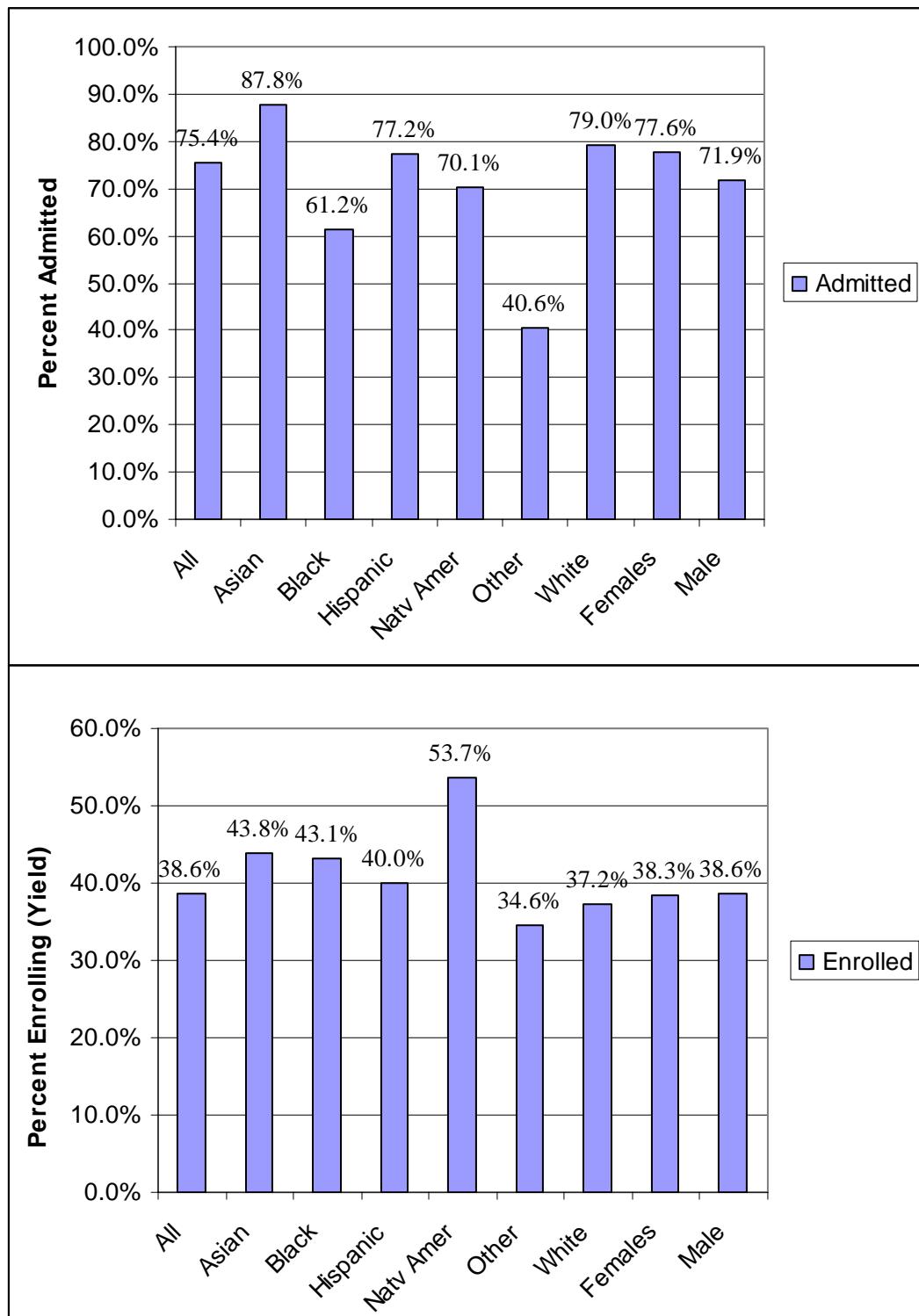
Applicants and Admits by Semester, 1996-1999

	All	Admits	% Admit	Yield All	Yield Admits
Fall Semester					
1996	7,705	5,809	75.4%	28.4%	37.7%
1997	8,088	5,994	74.1%	26.4%	35.6%
1998	8,326	6,428	77.2%	29.4%	38.1%
1999	9,573	7,376	77.1%	31.7%	41.2%
Summer Semester					
1996	958	729	76.1%	28.6%	37.6%
1997	1,091	833	76.4%	26.8%	35.1%
1998	1,504	1,101	73.2%	27.6%	37.7%
1999	1,894	1,373	72.5%	27.3%	37.7%

Figure 1 shows that some important differences occur among sexes and racial/ethnic groups relative to admissions and yields. The top panel shows that Asians have by far the highest rate of admittance. Four groups fall below the average admittance rate of 75.4%: Males, and, among racial/ethnic groups, Blacks, Native Americans and Other.

The bottom panel shows that yield of admitted students does not differ between sexes, but does, among racial/ethnic groups. Four groups: Native Americans (53.7%), Asians (43.8%),

Blacks (43.1%) and Hispanics (40.0%) all showed higher than average (38.6%) yield rates. Whites showed very nearly average yield rates (37.2%). The yield of Native Americans is extremely high, although, of course, this is a very small group. It is rather interesting that all minority groups except "Other" show above average yields of admits.



**Percent of Admits by Sex and Race/Ethnic Group Declining USF Offer**

## Number of SUS Institutions Applied to

The statistics in Table 2 indicate:

- Students applying to more than one institution are somewhat more likely to be admitted to USF (circa 80%) than are those who apply to USF alone (circa 70%).
- A precipitous decline occurs for those who apply only to USF (57%) and those who apply to at least one other SUS institution (32%) and lesser enrollments occur steadily as the number of applications increases.

**Table 2**

Admissions and Enrollments by Number of SUS Institutions Applied

		N of SUS Applications			
	Totals	1	2	3	4 or More
Totals	40,045	18,285	10,081	7,103	4,576
Admitted	30,040	75%	69%	80%	81%
Enrolled	11,539	38%	57%	32%	21%
					16%

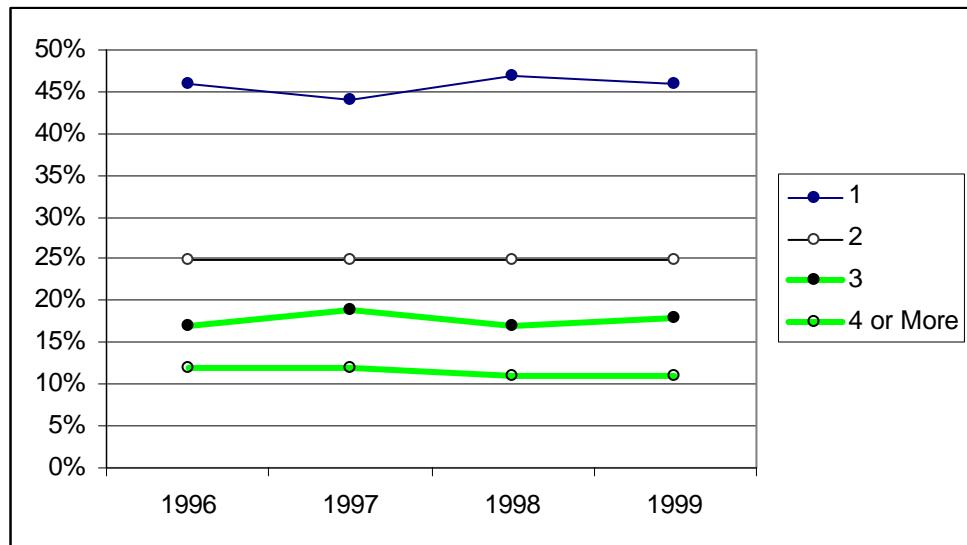
## Trends in Yields

Table 3 shows remarkable consistency in the percentage of applicants across years that apply to one or more SUS institutions. Only in the 1997 cohort did more than 46% apply to only USF. Every year, 25% applied to two institutions, and every year, 11-12% applied to four or more institutions. In 1999, despite the large increase in total applications, the percentage applying to only USF remained at 46%. Figure 2 displays these data graphically.

**Table 3**

Percent of Applications by Year and Number of SUS Applications

		N of SUS Applications			
	N	1	2	3	4 or More
96	9,082	46%	25%	17%	12%
97	9,179	44%	25%	19%	12%
98	9,830	47%	25%	17%	11%
99	11,954	46%	25%	18%	11%



**Figure 2**  
Percent of Applications by Year and Number of SUS Applications

### Differences in Yields by Geographical Location

Table 4 shows that substantial differences occur between the number of applicants/admits and the yield of admitted students across geographical locations. The eight largest locations (top of left columns) are left-justified (with Non-USA added), and, as the right columns show, regarding yields, these counties distribute from among the highest (Hillsborough, Pasco) to among the lowest in the entire table (Broward, Dade).

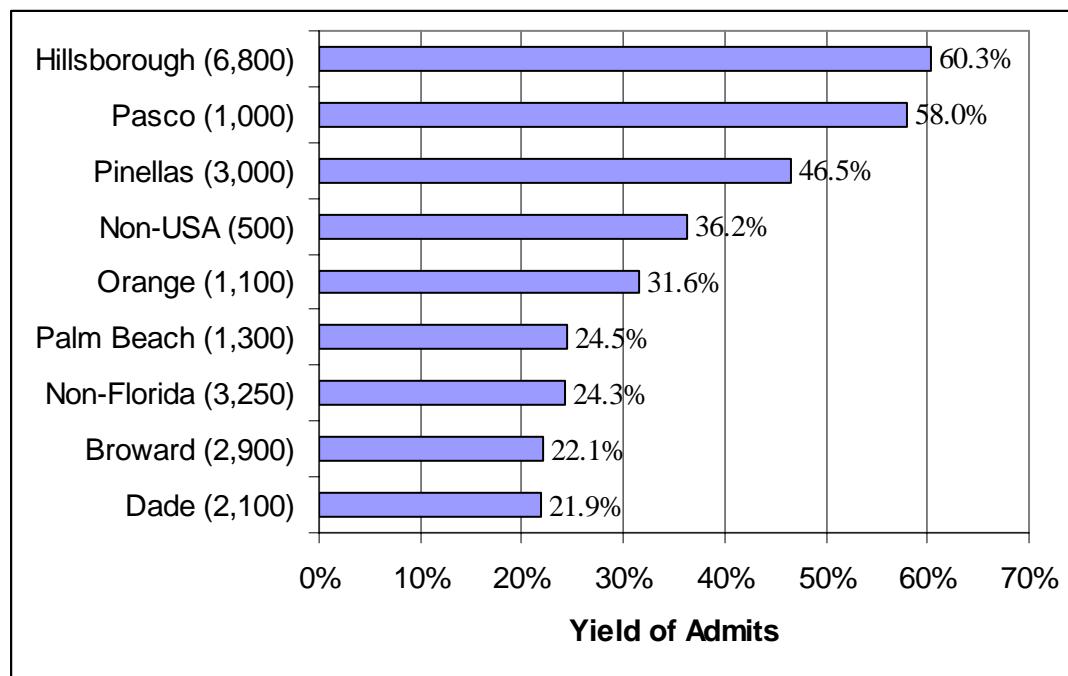
**Table 4**  
Yield of Admitted Applicants by Geographical Location 1996 to 1999 Cohorts

Sorted by Number of Admits			Sorted by Yield of Admitted		
	N	% Enrolled		N	% Enrolled
Hillsborough	6,840	60.3%	Franklin	1	100.0%
NonFla	3,244	24.3%	Glades	5	80.0%
Pinellas	2,956	46.5%	Hillsborough	6,840	60.3%
Broward	2,878	22.1%	Hernando	310	59.4%
Dade	2,066	21.9%	Pasco	1,022	58.0%
Palm Bch	1,297	24.5%	Bradford	7	57.1%
Orange	1,061	31.6%	Suwanee	11	54.5%
Pasco	1,022	58.0%	Gadsden	4	50.0%
Polk	861	39.8%	Hamilton	2	50.0%
Brevard	691	29.8%	Taylor	4	50.0%
Lee	683	31.8%	Okeechobee	23	47.8%
Sarasota	643	37.2%	Pinellas	2,956	46.5%
Seminole	633	24.2%	Hardee	24	45.8%
Duval	523	20.5%	Manatee	480	45.4%
NonUSA	486	36.2%	DeSoto	18	44.4%
Manatee	480	45.4%	Nassau	41	43.9%

Sorted by Number of Admits			Sorted by Yield of Admitted		
	N	% Enrolled		N	% Enrolled
Collier	368	33.7%	Charlotte	283	43.8%
Volusia	359	29.0%	Highlands	72	43.1%
Hernando	310	59.4%	Polk	861	39.8%
Charlotte	283	43.8%	Osceola	214	39.3%
Osceola	214	39.3%	Lake	194	38.7%
Lake	194	38.7%	Bay	44	38.6%
Citrus	166	36.1%	Sarasota	643	37.2%
Marion	162	35.2%	Jackson	11	36.4%
St Lucie	162	27.8%	NonUSA	486	36.2%
Alachua	161	27.3%	Citrus	166	36.1%
Martin	155	18.7%	Manatee	162	35.2%
Leon	140	22.1%	Collier	368	33.7%
Clay	98	26.5%	Baker	3	33.3%
Indian	98	21.4%	Union	3	33.3%
Monroe	94	29.8%	Walton	6	33.3%
St Johns	88	13.6%	Lee	683	31.8%
Escambia	80	28.8%	Orange	1,061	31.6%
Highlands	72	43.1%	Putnam	16	31.3%
Flagler	66	16.7%	Brevard	691	29.8%
Okeechobee	65	26.2%	Monroe	94	29.8%
Santa Rosa	47	29.8%	Santa Rosa	47	29.8%
Bay	44	38.6%	Volusia	359	29.0%
Nassau	41	43.9%	Escambia	80	28.8%
Sumter	25	28.0%	Sumter	25	28.0%
Hardee	24	45.8%	St Lucie	162	27.8%
Okeechobee	23	47.8%	Alachua	161	27.3%
Henderson	22	22.7%	Clay	98	26.5%
DeSoto	18	44.4%	Okaloosa	65	26.2%
Putnam	16	31.3%	Palm Bch	1,297	24.5%
Jackson	11	36.4%	NonFla	3,244	24.3%
Suwanee	11	54.5%	Seminole	633	24.2%
Bradford	7	57.1%	Hendry	22	22.7%
Columbia	7	0.0%	Leon	140	22.1%
Walton	6	33.3%	Broward	2,878	22.1%
Glades	5	80.0%	Dade	2,066	21.9%
Gadsden	4	50.0%	Indian	98	21.4%
Jefferson	4	0.0%	Duval	523	20.5%
Levy	4	0.0%	Martin	155	18.7%
Taylor	4	50.0%	Flagler	66	16.7%
Baker	3	33.3%	St Johns	88	13.6%

**Figure 3** clearly shows that among USF's largest sources of admitted students, within Florida, at least, proximity makes the heart grow fonder. It is very interesting that despite the large numbers of applicants and admits from such south Florida counties as Broward and Dade, USF's yield of these prospective students (circa 22%) is lower than for Non-

Florida admits (24%) and considerably lower than for Foreign Students (36%). The counties closest to USF's main campus exhibit the highest yield rates (Hillsborough, 60%), Pasco (58%) and Pinellas (47%), while Polk county's yield was 38%.



**Figure 3**  
Yield of Admits Among Largest Sources

Table 5 shows that by far the greatest single source of USF applicants is Hillsborough county. Other USF Service Area counties account for a smaller percentage of applications than does the rest of Florida. By far the smallest source of applicants is those from Non-US locations. Hillsborough county also provides the highest percentage (67%) of single institution applicants among local locations. Non-resident (59%) and Non-US students (80%) are very likely to apply only to USF among SUS institutions. However, applicants from non-USF Service counties in Florida are far more likely to apply to multiple institutions (75%) than to apply only to USF. These data suggest that applicants from Florida are far more likely to apply to multiple Florida Public Institutions than are those from outside Florida. It is probable that non-resident students apply to institutions in other states, which would make them also, multiple-institution applicants from a yield perspective.

**Table 5**  
Number of SUS Institutions Applied to by Geographical Location

	Totals		N of SUS Applications			
	N	% of Apps	1	2	3	4 or More
All	40,045		46%	25%	18%	11%
Hillsborough	8,723	22%	67%	20%	9%	4%
Pinellas	3,705	9%	51%	25%	16%	8%
Other USF Service	5,971	15%	46%	27%	17%	10%

	Totals		N of SUS Applications			
	N	% of Apps	1	2	3	4 or More
All USF Service	18,399	46%	57%	23%	13%	7%
Other Florida	15,196	38%	25%	29%	26%	19%
US Non-Florida	5,440	14%	59%	23%	11%	6%
Non-US	1,010	3%	80%	10%	5%	5%

### Differences Between Semesters

Table 6 shows that by far the most competitive term for applicants among SUS institutions is fall, the time when USF receives 84% of all applications. Among fall applicants, only 43% apply to USF alone. Those figures are respectively 53% and 87% among summer and spring applicants.

**Table 6**

Percent of Applicants by Term Applying to One or More SUS Institution

	N	N of SUS Applications			
		1	2	3	4 or More
Fall	33,692	43%	26%	19%	12%
Spring	906	87%	9%	3%	1%
Summer	5,447	53%	22%	15%	10%

### Academic Qualifications and Number of Applications

Table 7 shows that among USF's applicants, lower test scores and GPA associate with applying to only USF. This is true for GPA, where 58% of those having a GPA below 2.0 applied only to USF, while steadily decreasing numbers with higher GPAs did so. This is true for SAT scores, where 55% of those having an SAT below 900 applied only to USF while steadily decreasing percentages with higher scores did so and also, with ACT test scores. This suggests that more intra-institution competition occurs in the SUS for students having higher academic qualifications.

**Table 7**

Percent of Applicants by Scores Applying to Only One SUS Institution

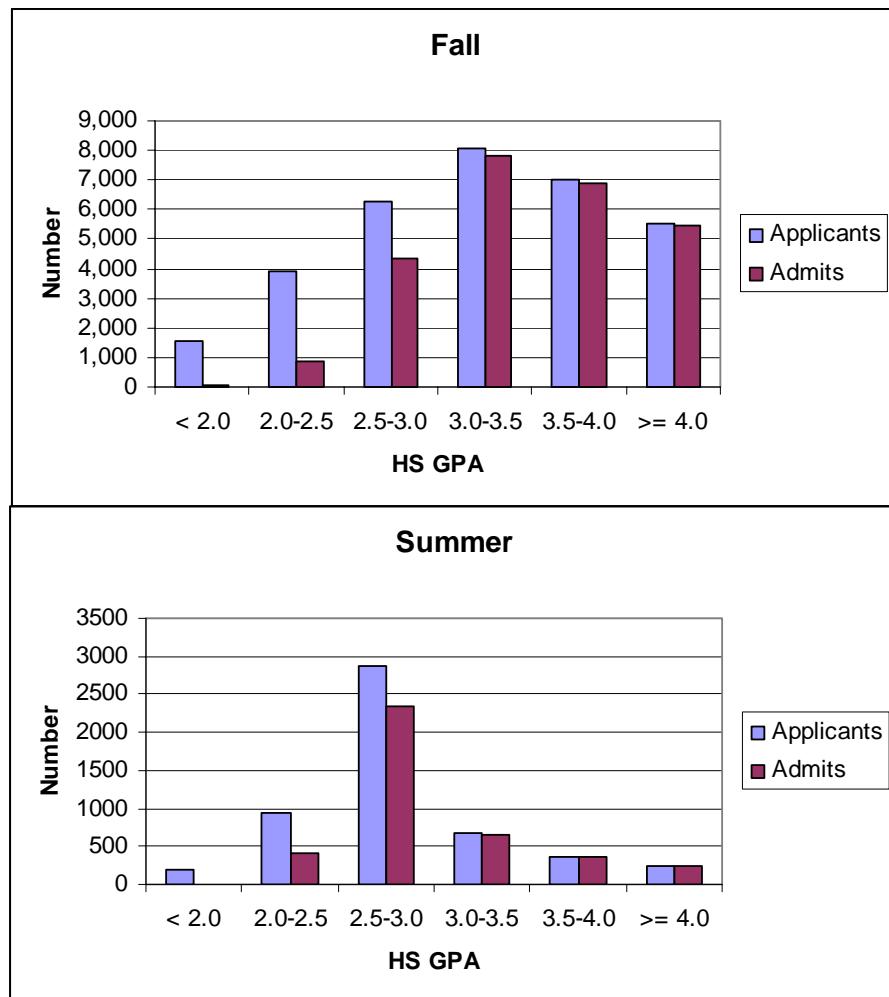
GPA		SAT		ACT	
Score	% One	Score	% One	Score	% One
< 2.0	58%	<900	55%	<18	51%
2.0-2.5	52%	900-990	44%	18-20	44%
2.5-3.0	49%	990-1050	39%	20-22	37%
3.0-3.5	42%	1050-1150	37%	22-25	35%
3.5-4.0	39%	1150-1600	35%	>=25	33%
>=4.0	34%				

Table 8 indicates that some 1-3% of those over 3.0 who were not admitted withdrew their applications. Withdrawal percentages are consistent across all GPA groups, which indicates that 95% of less than 2.0 are rejected, 74% of 2.0-2.5 and 28% of 2.5-3.0 applicants. These data also indicate that those with a GPA above 4.0 are less likely to withdraw their USF application than are those with a GPA between 3.0 and 4.0. In the summer, applicants with

a GPA of 2.0-3.0 are considerably more likely to be admitted than in the fall. As a result, as Figure 4 shows, while the great majority of fall applicants have a HS GPA between 2.5-4.0, by far the greatest percentage of summer applicants have a GPA between 2.5-3.0.

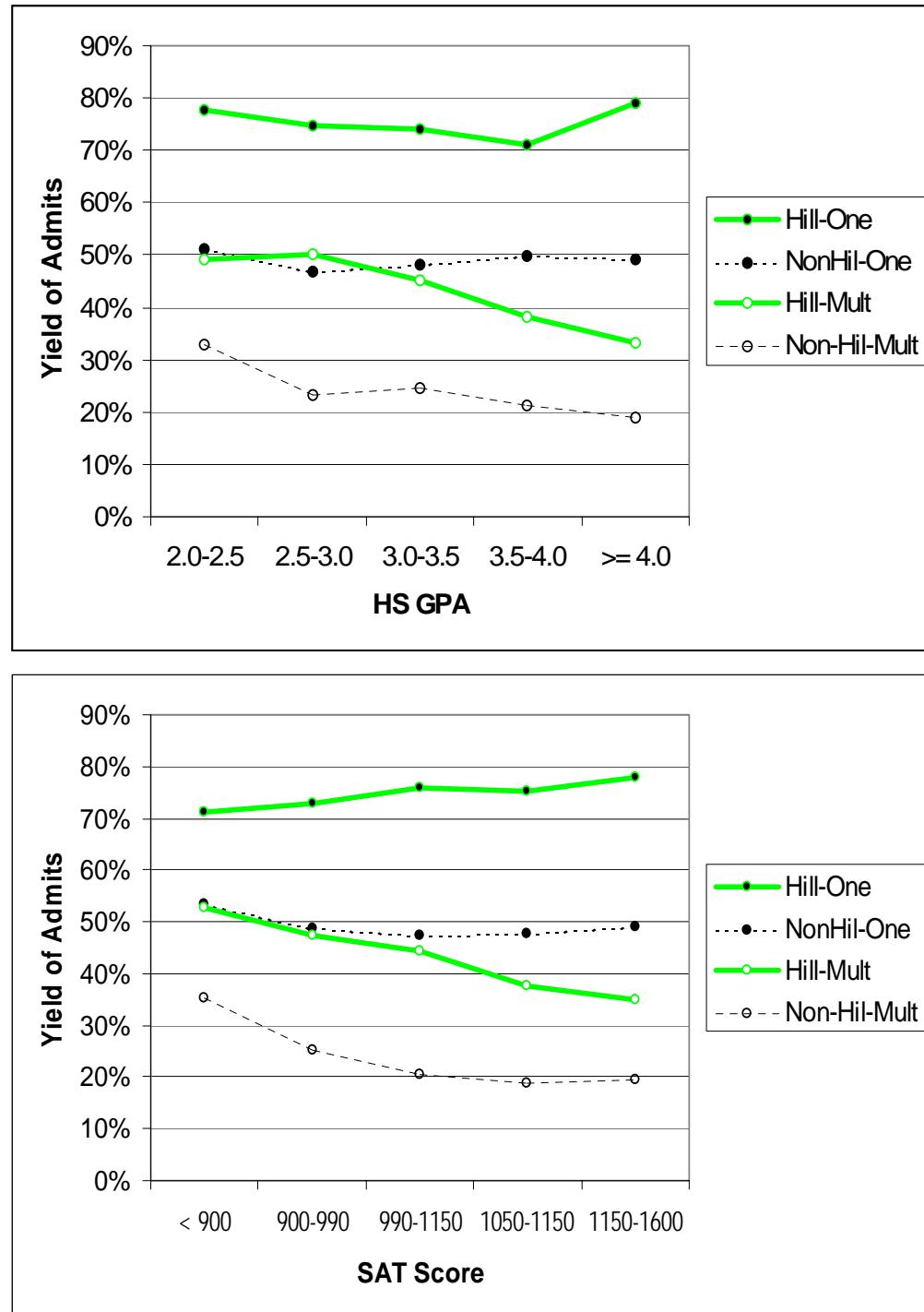
**Table 8**  
Number of Applicants and Admits by GPA Category – 1996 - 1999

	Applicants		Admits		Percent Admitted	
	Fall	Summer	Fall	Summer	Fall	Summer
< 2.0	1,554	191	34	10	2%	5%
2.0-2.5	3,915	951	895	419	23%	44%
2.5-3.0	6,278	2861	4,317	2333	69%	82%
3.0-3.5	8,052	681	7,811	658	97%	97%
3.5-4.0	7,003	363	6,877	356	98%	98%
>= 4.0	5,546	237	5,464	233	99%	98%
All	32,348	5,284	25,398	4,009	79%	76%



**Figure 4**  
Number of Fall Applicants and Admits by GPA Category

Figure 5 shows an interaction between the number of applications and yield by GPA. For single institution applicants, GPA and yield do not relate. For multiple institution applicants, yield relates negatively with GPA. The same trends occur both for local (Hillsborough County) and distant applicants. The bottom panel shows that precisely the same effects occur for test scores.



**Figure 5**  
Yield of All Admits by Location, GPA and N of Applications

## Seeking Trends Among Relevant Variables

Table 9, for fall, shows that except where small samples occur (e.g. NonUSA applicants to 4 or more SUS institutions), the percentages of applicants applying to one or more institutions remains remarkably consistent over time. The only situation where it appears trends away from the average across four years may be occurring is among NonUSA applicants, where the percentage applying to only USF may be falling. The second half of the table shows that considerably greater variability occurs among summer applicants, and again, it appears that the NonUSA applicants may be more likely to apply to multiple SUS institutions today than four years ago.

**Table 9**

Trends of Single and Multiple Institution Applicants by Geographical Location

		N of SUS Institutions Applied to			
		1	2	3	4 or More
		Fall Semester			
Hillsborough	1996	61%	25%	10%	4%
	1997	64%	20%	12%	5%
	1998	65%	22%	9%	3%
	1999	64%	21%	10%	5%
Other USF	1996	44%	27%	19%	10%
	1997	43%	28%	19%	10%
	1998	47%	27%	17%	9%
	1999	44%	28%	18%	10%
Other Florida	1996	23%	29%	27%	20%
	1997	22%	29%	28%	21%
	1998	23%	30%	28%	19%
	1999	22%	30%	26%	22%
Other USA	1996	56%	26%	11%	7%
	1997	57%	25%	12%	7%
	1998	60%	22%	11%	7%
	1999	57%	23%	13%	7%
Non-USA	1996	84%	8%	5%	3%
	1997	77%	11%	7%	5%
	1998	77%	13%	5%	5%
	1999	72%	12%	8%	8%
Summer Semester					
Hillsborough	1996	83%	13%	3%	2%
	1997	82%	11%	5%	2%
	1998	76%	13%	6%	4%
	1999	77%	14%	6%	3%
Other USF	1996	64%	18%	11%	7%
	1997	69%	15%	11%	5%
	1998	62%	22%	8%	7%
	1999	62%	22%	10%	5%
Other Florida	1996	35%	22%	21%	22%

		N of SUS Institutions Applied to			
		1	2	3	4 or More
	1997	35%	26%	22%	17%
	1998	34%	27%	20%	19%
	1999	33%	31%	26%	10%
Other USA	1996	71%	22%	8%	0%
	1997	78%	11%	9%	2%
	1998	84%	11%	4%	1%
	1999	78%	17%	6%	0%
Non-USA	1996	82%	18%	0%	0%
	1997	88%	12%	0%	0%
	1998	96%	0%	4%	0%
	1999	63%	25%	13%	0%

### Final Grouping of Geographical Locations

Table 10 and Table 11 show the most appropriate geographical breakout based on sample sizes and yields for conducting analyses. These will be defined as the Final Location groups in further discussion.

**Table 10**

Final Geographic Groups with Components Summer 1996 to Fall 1999

	N Admitted	% Enrolled
1st	8,026	59.9%
2nd	3,782	46.0%
3rd	1,481	38.2%
4th	1,725	31.1%
Other Florida	10,985	24.9%
Non-Florida	3,202	24.1%
Non-USA	442	34.8%
Locations		
1st	8,026	59.9%
Glades	5	80.0%
Hillsborough	6,711	60.2%
Hernando	306	59.5%
Pasco	1,004	57.6%
2nd	3,782	46.0%
Desoto	17	47.1%
Pinellas	2,913	46.4%
Hardee	24	45.8%
Manatee	473	45.0%
Charlotte	283	43.8%
Highlands	72	43.1%
3rd	1,481	38.2%
Polk	849	39.3%

	N Admitted	% Enrolled
Sarasota	632	36.7%
4th	1,725	31.1%
Collier	365	33.7%
Lee	678	31.4%
Brevard	682	29.5%

**Table 11**  
Members and Percentages by Geographical Groups

	N Admits	% Enrolled
1st	7,070	60.4%
2nd	3,361	46.5%
3rd	1,297	36.9%
4th	1,573	30.8%
Other Florida	8,913	24.2%
Non-Florida	3,000	24.3%
Non-USA	393	34.9%
<b>Members</b>		
1 <sup>st</sup>	2 <sup>nd</sup>	3rd
Glades	Pinellas	Polk
Hillsborough	Hardee	Sarasota
Hernando	Manatee	4th
Pasco	Desoto	Brevard
	Charlotte	Collier
	Highlands	Lee

Table 12 shows distributions of yields and numbers of applicants by number of institutions applied to and county distribution.

**Table 12**  
Totals, All Students by Semester, N of Institutions and Yields

	N Institutions	All	Yield			Percent of Population	
			Admits	Applicants	Admits	N Institutions	Admits
<b>Fall</b>							
All	All	32,348	25,398	30.0%	38.2%		78.5%
	2 or more	18,727	15,377	20.9%	25.5%	57.9%	82.1%
	1	13,621	10,021	42.5%	57.8%	42.1%	73.6%
	2	8,631	7,049	26.8%	32.8%	26.7%	81.7%
	3	6,141	5,099	17.7%	21.4%	19.0%	83.0%
	4 or More	3,955	3,229	13.1%	16.1%	12.2%	81.6%
Highest	All	8,453	7,020	50.0%	60.2%		83.0%
	2 or more	3,255	2,931	36.3%	40.3%	38.5%	90.0%
	1	5,198	4,089	58.6%	74.4%	61.5%	78.7%
	2	1,899	1,707	41.5%	46.2%	22.5%	89.9%
	3	946	853	30.3%	33.6%	11.2%	90.2%

				Yield		Percent of Population	
	N Institutions	All	Admits	Applicants	Admits	N Institutions	Admits
	4 or More	410	371	26.1%	28.8%	4.9%	90.5%
2nd	All	4,023	3,350	38.7%	46.4%		83.3%
	2 or more	2,180	1,888	29.5%	34.1%	54.2%	86.6%
	1	1,843	1,462	49.5%	62.4%	45.8%	79.3%
	2	1,098	944	36.2%	42.1%	27.3%	86.0%
	3	738	643	23.6%	27.1%	18.3%	87.1%
	4 or More	344	301	20.9%	23.9%	8.6%	87.5%
3rd	All	1,596	1,297	30.0%	36.9%		81.3%
	2 or more	932	795	23.2%	27.2%	58.4%	85.3%
	1	664	502	39.6%	52.4%	41.6%	75.6%
	2	490	423	27.8%	32.2%	30.7%	86.3%
	3	287	238	19.5%	23.5%	18.0%	82.9%
	4 or More	155	134	15.5%	17.9%	9.7%	86.5%
4th	All	1,839	1,570	26.4%	30.9%		85.4%
	2 or more	1,386	1,209	20.2%	23.2%	75.4%	87.2%
	1	453	361	45.3%	56.8%	24.6%	79.7%
	2	584	501	25.2%	29.3%	31.8%	85.8%
	3	475	420	17.7%	20.0%	25.8%	88.4%
	4 or More	327	288	15.0%	17.0%	17.8%	88.1%
Other-FLA	All	11,309	8,896	19.0%	24.1%		78.7%
	2 or more	8,776	7,103	15.0%	18.6%	77.6%	80.9%
	1	2,533	1,793	32.6%	46.1%	22.4%	70.8%
	2	3,343	2,685	20.3%	25.3%	29.6%	80.3%
	3	3,078	2,512	13.3%	16.3%	27.2%	81.6%
	4 or More	2,355	1,906	9.8%	12.1%	20.8%	80.9%
Non-FLA	All	4,696	2,978	15.4%	24.3%		63.4%
	2 or more	2,039	1,341	12.6%	19.2%	43.4%	65.8%
	1	2,657	1,637	17.5%	28.5%	56.6%	61.6%
	2	1,141	733	13.4%	20.9%	24.3%	64.2%
	3	574	404	12.7%	18.1%	12.2%	70.4%
	4 or More	324	204	9.6%	15.2%	6.9%	63.0%
Non-USA	All	432	287	22.7%	34.1%		66.4%
	2 or more	159	110	15.7%	22.7%	36.8%	69.2%
	1	273	177	26.7%	41.2%	63.2%	64.8%
	2	76	56	18.4%	25.0%	17.6%	73.7%
	3	43	29	14.0%	20.7%	10.0%	67.4%
	4 or More	40	25	12.5%	20.0%	9.3%	62.5%
Summer							
All	All	5,284	4,009	28.1%	37.0%		75.9%
	2 or more	2,554	1,946	17.5%	23.0%	48.3%	76.2%
	1	2,730	2,063	38.0%	50.3%	51.7%	75.6%
	2	1,184	952	22.7%	28.3%	22.4%	80.4%
	3	822	610	14.4%	19.3%	15.6%	74.2%
	4 or More	548	384	10.9%	15.6%	10.4%	70.1%

				Yield		Percent of Population	
	N Institutions	All	Admits	Applicants	Admits	N Institutions	Admits
Highest	All	1,214	945	43.7%	56.2%		77.8%
	2 or more	273	219	31.1%	38.8%	22.5%	80.2%
	1	941	726	47.4%	61.4%	77.5%	77.2%
	2	173	144	39.3%	47.2%	14.3%	83.2%
	3	65	53	18.5%	22.6%	5.4%	81.5%
	4 or More	35	22	14.3%	22.7%	2.9%	62.9%
2nd	All	542	419	32.3%	41.8%		77.3%
	2 or more	206	162	22.8%	29.0%	38.0%	78.6%
	1	336	257	38.1%	49.8%	62.0%	76.5%
	2	105	89	24.8%	29.2%	19.4%	84.8%
	3	67	47	23.9%	34.0%	12.4%	70.1%
	4 or More	34	26	14.7%	19.2%	6.3%	76.5%
3rd	All	236	183	36.4%	47.0%		77.5%
	2 or more	80	64	21.3%	26.6%	33.9%	80.0%
	1	156	119	44.2%	58.0%	66.1%	76.3%
	2	50	39	26.0%	33.3%	21.2%	78.0%
	3	12	12	25.0%	25.0%	5.1%	100.0%
	4 or More	18	13	5.6%	7.7%	7.6%	72.2%
4th	All	204	152	25.5%	34.2%		74.5%
	2 or more	108	77	15.7%	22.1%	52.9%	71.3%
	1	96	75	36.5%	46.7%	47.1%	78.1%
	2	58	43	19.0%	25.6%	28.4%	74.1%
	3	34	25	11.8%	16.0%	16.7%	73.5%
	4 or More	16	9	12.5%	22.2%	7.8%	56.3%
Other-FLA	All	2,692	2,069	21.7%	28.2%		76.9%
	2 or more	1,798	1,359	14.7%	19.5%	66.8%	75.6%
	1	894	710	35.7%	44.9%	33.2%	79.4%
	2	737	592	18.9%	23.5%	27.4%	80.3%
	3	619	455	12.8%	17.4%	23.0%	73.5%
	4 or More	442	312	10.6%	15.1%	16.4%	70.6%
Non-FLA	All	339	201	12.7%	21.4%		59.3%
	2 or more	73	53	16.4%	22.6%	21.5%	72.6%
	1	266	148	11.7%	20.9%	78.5%	55.6%
	2	49	36	20.4%	27.8%	14.5%	73.5%
	3	21	15	9.5%	13.3%	6.2%	71.4%
	4 or More	3	2	0.0%	0.0%	0.9%	66.7%
Non-USA	All	57	40	22.8%	32.5%		70.2%
	2 or more	16	12	25.0%	33.3%	28.1%	75.0%
	1	41	28	22.0%	32.1%	71.9%	68.3%
	2	12	9	16.7%	22.2%	21.1%	75.0%
	3	4	3	50.0%	66.7%	7.0%	75.0%
	4 or More	0	0				

Table 13 and Table 14 show respectively for fall and summer, a summary of yield rates across Final Location groups and GPA groups by the number of institutions applied to. Should the following error analyses indicate that these are optimum predictive methods, this will provide the source for developing specific predictions.

**Table 13**  
Fall Semester Statistics

	N Instns	Number of Admits					Yield of Admits				
		2.0-2.5	2.5-3.0	3.0-3.5	3.5-4.0	>= 4.0	2.0-2.5	2.5-3.0	3.0-3.5	3.5-4.0	>= 4.0
All	All	895	4,317	7,811	6,877	5,464	47.6%	39.0%	39.9%	37.0%	35.2%
	1	447	1,844	3,251	2,660	1,795	59.1%	56.6%	56.6%	57.1%	61.6%
	2 or more	448	2,473	4,560	4,217	3,669	36.2%	25.8%	28.0%	24.3%	22.2%
Highest	All	189	1,034	2,019	1,983	1,781	69.3%	65.7%	64.1%	57.4%	54.6%
	1	129	680	1,292	1,117	858	78.3%	74.1%	74.5%	71.6%	77.7%
	2 or more	60	354	727	866	923	50.0%	49.4%	45.5%	39.1%	33.2%
2nd	All	93	525	1,000	958	773	61.3%	50.9%	51.5%	45.7%	36.0%
	1	55	255	486	404	261	78.2%	64.7%	63.6%	61.1%	56.7%
	2 or more	38	270	514	554	512	36.8%	37.8%	40.1%	34.5%	25.4%
3rd	All	44	176	364	365	344	50.0%	44.3%	39.0%	34.0%	31.7%
	1	20	69	144	152	116	60.0%	66.7%	45.1%	52.6%	50.9%
	2 or more	24	107	220	213	228	41.7%	29.9%	35.0%	20.7%	21.9%
4th	All	19	173	429	443	504	68.4%	31.8%	36.1%	28.4%	26.8%
	1	7	50	109	97	96	85.7%	60.0%	56.9%	56.7%	53.1%
	2 or more	12	123	320	346	408	58.3%	20.3%	29.1%	20.5%	20.6%
Other-FLA	All	265	1,457	2,949	2,446	1,774	43.4%	25.0%	25.9%	22.6%	19.7%
	1	81	283	626	510	292	66.7%	50.5%	44.9%	43.3%	43.5%
	2 or more	184	1,174	2,323	1,936	1,482	33.2%	18.8%	20.7%	17.1%	15.0%
Non-FLA	All	266	896	948	600	263	30.1%	24.3%	22.9%	22.5%	26.6%
	1	143	472	534	326	158	28.7%	29.4%	25.8%	29.1%	31.6%
	2 or more	123	424	414	274	105	31.7%	18.6%	19.1%	14.6%	19.0%
Non-USA	All	19	56	102	82	25	42.1%	37.5%	30.4%	35.4%	24.0%
	1	12	35	60	54	14	58.3%	48.6%	38.3%	37.0%	28.6%
	2 or more	7	21	42	28	11	14.3%	19.0%	19.0%	32.1%	18.2%

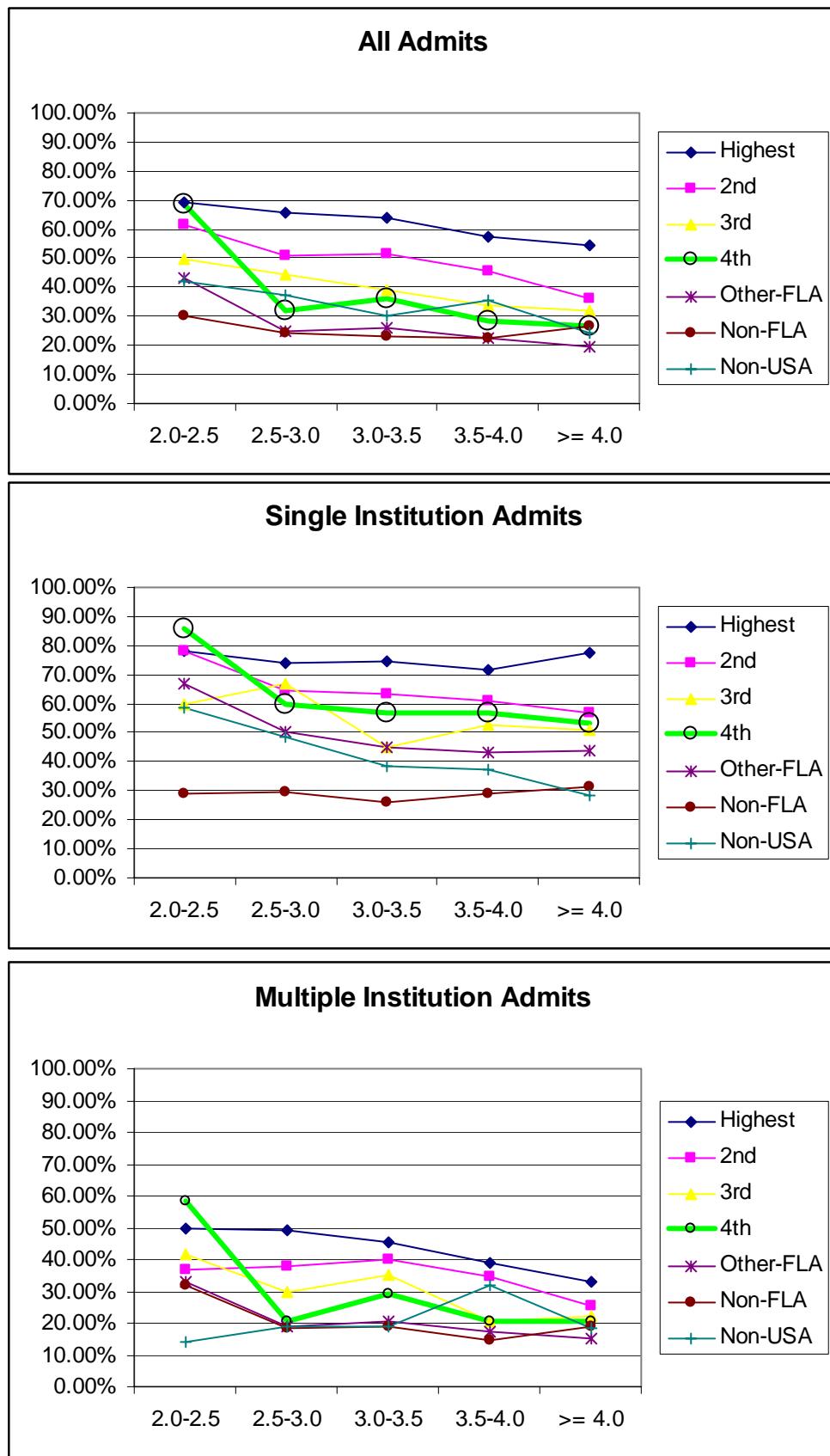
**Table 14**  
Summer Semester Statistics by Final Location, N of Institutions and GPA Group

	N Instns	Number of Admits					Yield of Admits				
		2.0-2.5	2.5-3.0	3.0-3.5	3.5-4.0	>= 4.0	2.0-2.5	2.5-3.0	3.0-3.5	3.5-4.0	>= 4.0
All	All	419	2,333	658	356	233	43.9%	39.1%	31.0%	31.2%	27.5%
	1	256	1,325	239	143	93	52.7%	48.2%	56.5%	53.1%	49.5%
	2 or more	163	1,008	419	213	140	30.1%	27.2%	16.5%	16.4%	12.9%
Highest	All	100	545	121	103	72	64.0%	56.1%	52.9%	58.3%	47.2%
	1	91	433	85	68	45	64.8%	59.6%	62.4%	66.2%	62.2%
	2 or more	9	112	36	35	27	55.6%	42.9%	30.6%	42.9%	22.2%

	N Instns	Number of Admits					Yield of Admits				
		2.0-2.5	2.5-3.0	3.0-3.5	3.5-4.0	>= 4.0	2.0-2.5	2.5-3.0	3.0-3.5	3.5-4.0	>= 4.0
2nd	All	37	245	70	44	23	56.8%	44.9%	35.7%	34.1%	17.4%
	1	23	166	34	20	14	69.6%	48.8%	58.8%	45.0%	14.3%
	2 or more	14	79	36	24	9	35.7%	36.7%	13.9%	25.0%	22.2%
3rd	All	8	102	37	23	12	62.5%	43.1%	54.1%	39.1%	58.3%
	1	7	73	22	11	5	57.1%	49.3%	72.7%	72.7%	80.0%
	2 or more	1	29	15	12	7	100.0%	27.6%	26.7%	8.3%	42.9%
4th	All	10	93	22	14	12	30.0%	38.7%	31.8%	21.4%	16.7%
	1	7	55	6	3	3	28.6%	47.3%	66.7%	33.3%	33.3%
	2 or more	3	38	16	11	9	33.3%	26.3%	18.8%	18.2%	11.1%
Other-FLA	All	217	1,184	388	164	112	36.4%	32.3%	21.1%	13.4%	14.3%
	1	90	476	83	36	24	51.1%	44.7%	44.6%	33.3%	41.7%
	2 or more	127	708	305	128	88	26.0%	23.9%	14.8%	7.8%	6.8%
Non-FLA	All	40	135	18	7	1	20.0%	21.5%	22.2%	28.6%	0.0%
	1	32	103	8	4	1	15.6%	20.4%	50.0%	25.0%	0.0%
	2 or more	8	32	10	3	0	37.5%	25.0%	0.0%	33.3%	
Non-USA	All	7	29	2	1	1	57.1%	20.7%	100.0%	0.0%	100.0%
	1	6	19	1	1	1	50.0%	21.1%	100.0%	0.0%	100.0%
	2 or more	1	10	1	0	0	100.0%	20.0%	100.0%		

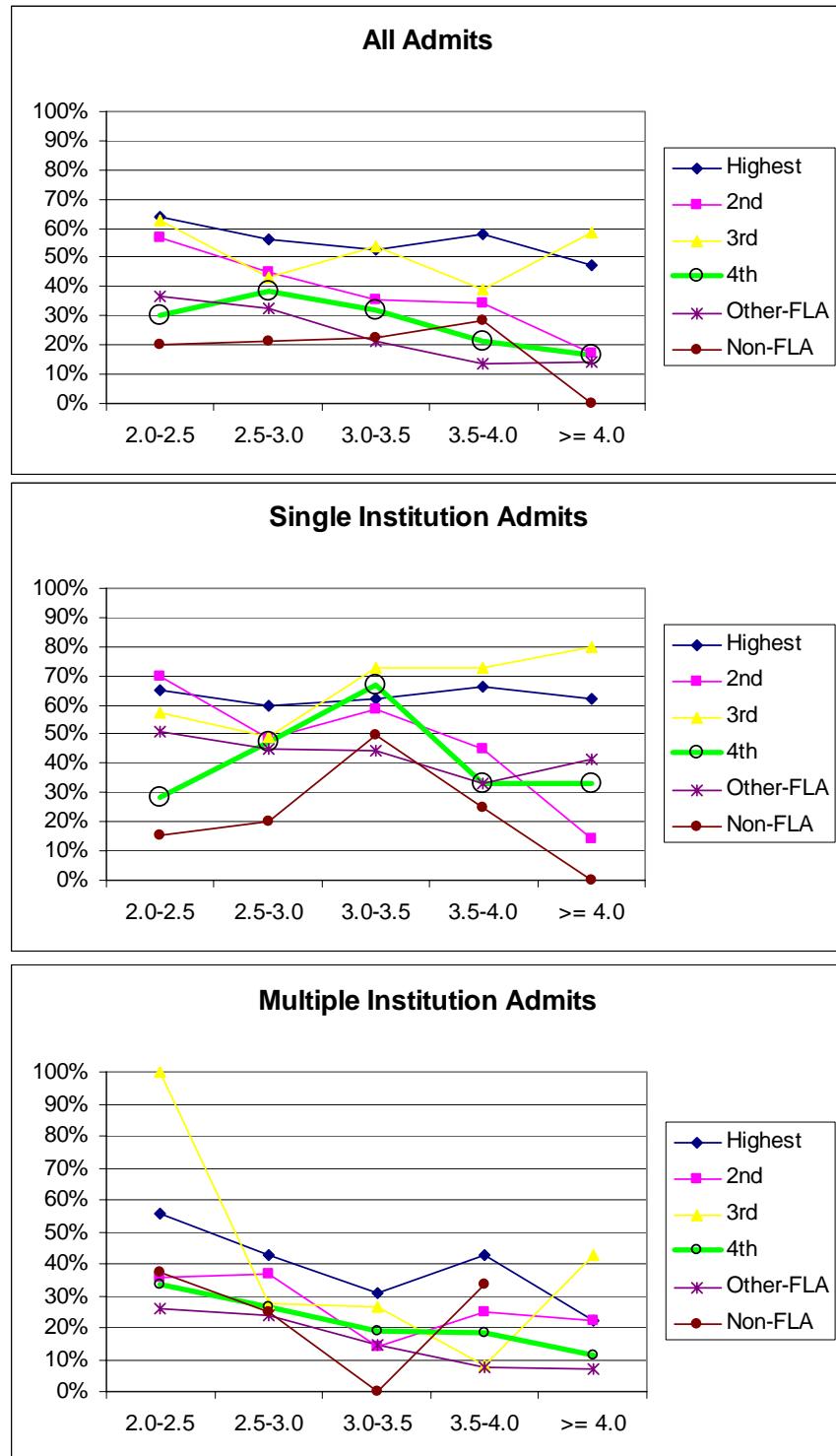
Regarding fall semester admits, the top panel of Figure 6 indicates<sup>1</sup> that slight drop-offs in yields occur for both single institution and multiple institution applicants as GPA improves. This is particularly true for the 4<sup>th</sup> Highest Yield Group (Brevard, Collier and Lee counties), where a substantial drop in yield occurs for admits having above a 2.5 GPA (it flattens after that, however). The second panel (Single Institution Admits) shows essentially the same yield at all GPAs for the Highest, 3<sup>rd</sup> Highest and Non-Florida admits; a gentle downward slope for 2<sup>nd</sup> and Other-Florida admits; and an extremely steep slope between 2.0 and 3.0, with a far more gentle slope thereafter for 4<sup>th</sup> and Non-USA admits. The third panel shows considerably lower and generally downward slopes among multiple institution applicants, with the exception of Non-USA admits where higher GPAs associate with higher yields.

<sup>1</sup> Somewhat contrary to Figure 5 which included both fall and summer admits.



**Figure 6**  
Fall Yield of Admits by GPA, Single or Multiple Institution Applications and Location

Figure 7 depicts yields of admits for summer terms. The sample here, is considerably smaller, and Non-USA admits have been eliminated due to their small size. Among all applicants, a gentle downward slope similar to fall data occurs for the trend from lower to higher GPA. However, due to the smaller and less reliable samples, this slope is not as consistent as the fall.



**Figure 7**  
Summer Yield of Admits by GPA, Single or Multiple Institution Applications and Location

## Testing A Possible Alternative Prediction Method

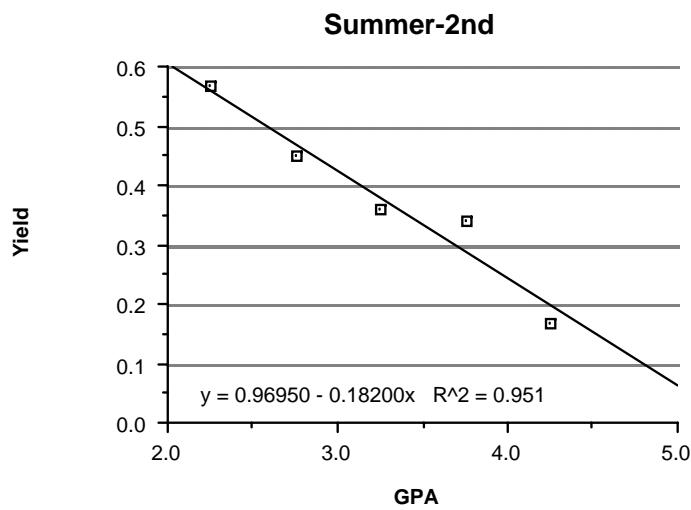
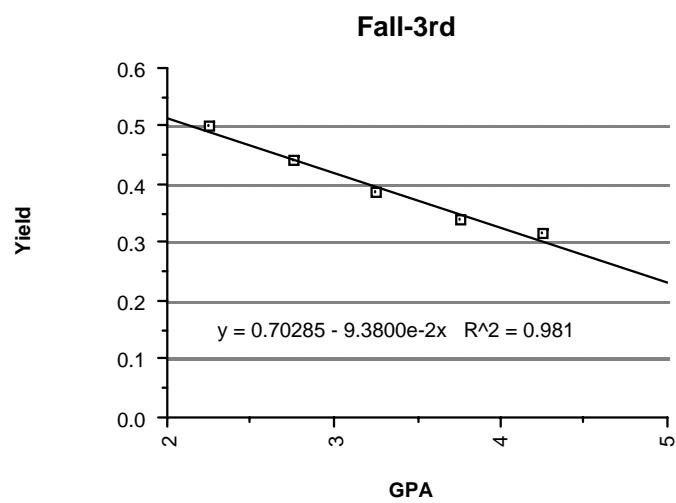
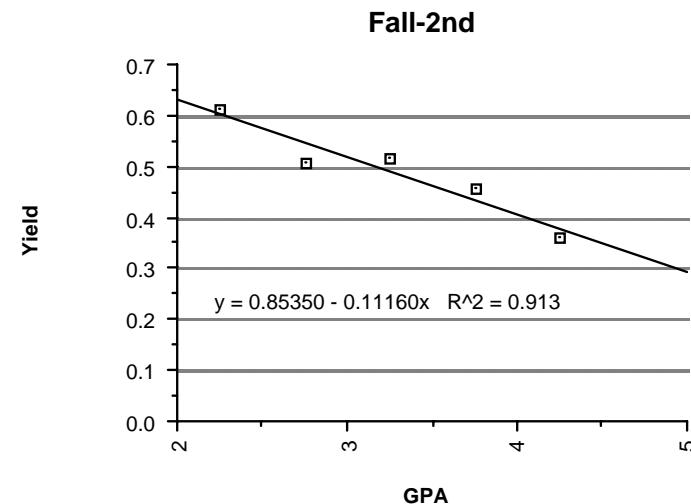
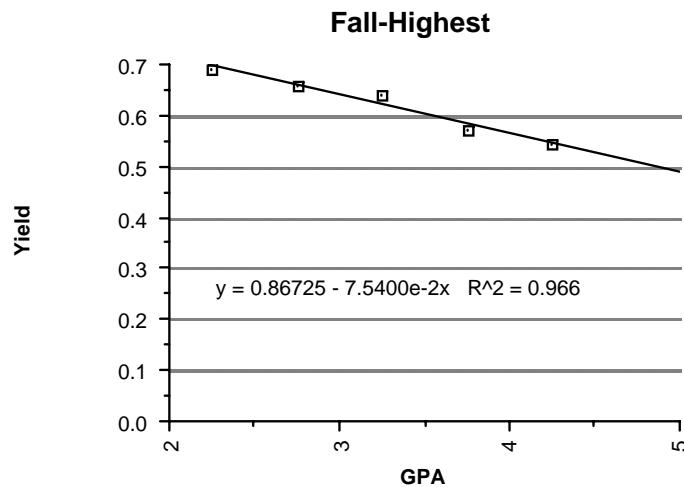
At this point, with samples ranging from 7 (4<sup>th</sup> single institution 2.0-2.5) to 2,323 (Other Florida-multiple institution, 3.0-3.5) as a result of breaking four years worth of data into multiple groups, it is not feasible to attempt any trend analyses to see if such phenomena affect yields within groups.

Percentages of multiple institution applicants remain consistent over time. Figure 6 and Figure 7 indicate that, if all applicants within a geographical location and GPA category are combined, that a relatively linear trend (past specific points for specific subgroups) in yields relative to GPA occurs in both summer and fall. Linear regression models that could result from such trends allow one to develop yield estimates to the tenth of a GPA point. To test this, regression models were run separately for appropriate Final Geographic groups using HS GPA as the predictor (x) variable, and yield percentage as the dependent (y) variable (Figure 8 shows four resultant regression fits).

Table 15 shows the three fall semester geographical groups and two summer groups for which an acceptable linear fit between GPA and yield occurred. In all cases, the obtained  $R^2$  was at least .91 ( $r=.95$  or higher). Applying these formulae to specific GPA points within groups will produce specific yield estimates. In this method, for all other situations lacking a linear fit, GPA category midpoints were used for projecting yields.

**Table 15**  
Regression Models that Provide a Good Fit to Yield Tendencies

Semester and Group	Intercept	Beta (x value)	$R^2$
fall-Highest	.867	-.075	.966
fall-2 <sup>nd</sup> Highest	.854	-.111	.911
fall-3 <sup>rd</sup> Highest	.703	-.094	.981
summer-2 <sup>nd</sup> Highest	.97	-.18	.951
summer-Other Florida	.642	-.126	.913



**Figure 8**  
**Examples of Regression Models having Good Fits with Data**

## Error Analysis

Having developed the possible prediction methods shown above, an error analysis was conducted to compare:

- Error by year by prediction type using source cohorts (1996-1999)
- Error by year by prediction type using non-source cohorts (1994-1995)

Four different prediction models were compared:

1. Global - a single average percentage was applied to all admits
2. Cty Only - By Final Location groups (a single percentage applied to all admits separately for each of the seven locations – Highest, 2<sup>nd</sup>, etc.)
3. Cty X GPA - By Final Location groups separately for each GPA group (2.0-2.5, 2.5-3.0, etc.)
4. Detailed – Where appropriate (see Table 15), each applicant was given a probability based on their High School GPA, where not, a probability was assigned using the Cty X GPA method.

Table 16 shows the error rates by year that associate with each of the above prediction methods. This table shows that different methods work better for different cohorts, but that all methods work considerably better for the source years (1996-1999) than for the non-source years (1994-1995). Obviously, the 1997 cohort was most far removed from the average. Among the fall source data, the predictors having least error were – Global – 1996, 1998; Detailed – 1997; Cty Only – 1999. For non-source they were Detailed, 1995 and Cty Only – 1994. The worst predictors were – Cty Only – 1996, 1997, 1998; Global – 1994, 1995 and 1999. summer results showed similar variability.

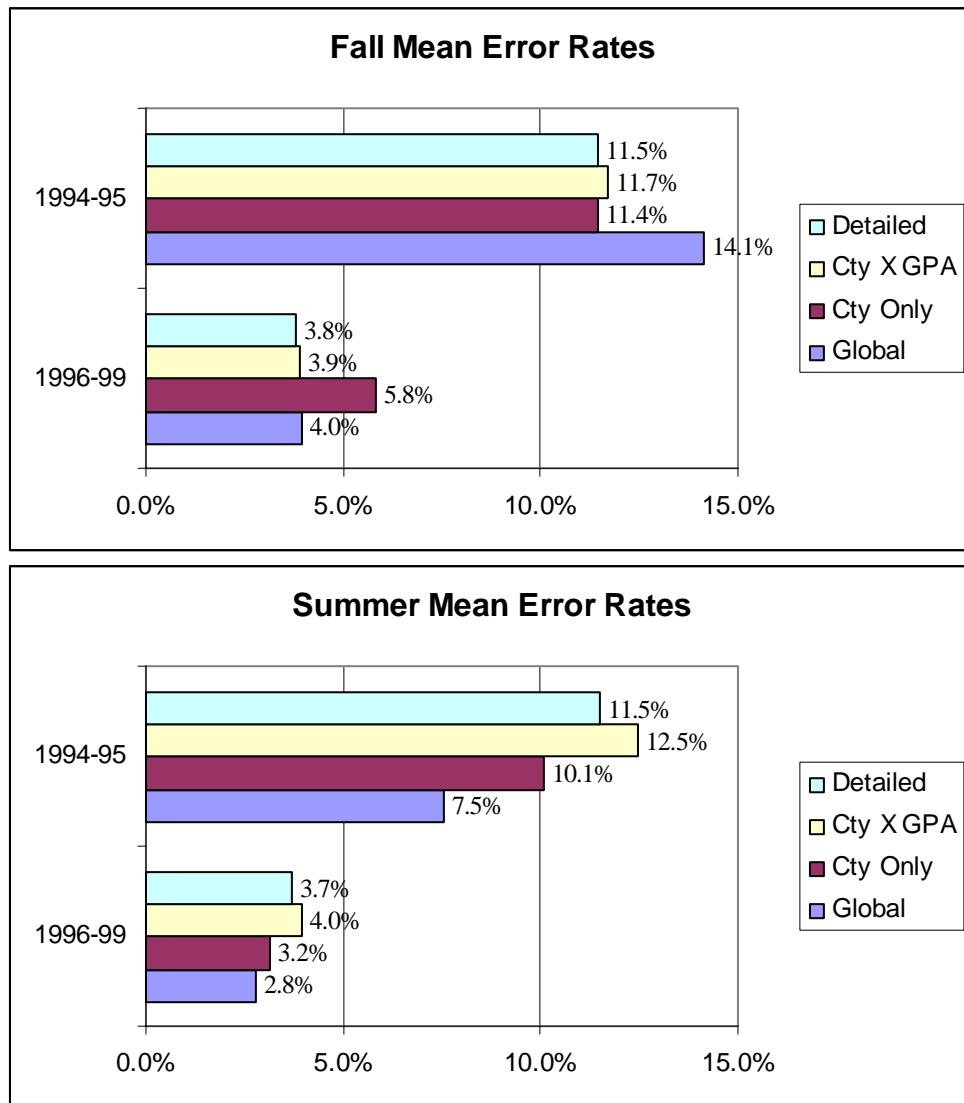
**Table 16**  
Error Percentages by Predictive Type Across Source and Non-Source Cohorts

	Non-Source Cohorts		Source Cohorts			
	1994	1995	1996	1997	1998	1999
<b>Fall</b>						
Global	16.46%	11.80%	1.23%	7.15%	0.19%	7.25%
Cty Only	13.79%	9.07%	4.40%	11.79%	4.76%	2.42%
Cty X GPA	14.35%	9.01%	2.35%	7.41%	0.52%	5.43%
Detailed	14.13%	8.79%	2.18%	7.10%	0.33%	5.62%
<b>Summer</b>						
Global	7.07%	7.98%	1.29%	5.95%	2.10%	1.90%
Cty Only	9.62%	10.53%	1.42%	8.97%	2.00%	0.27%
Cty X GPA	12.22%	12.71%	1.71%	9.37%	0.37%	4.36%
Detailed	11.08%	11.90%	1.07%	7.92%	0.62%	5.26%

Figure 9 shows average error rates separately by prediction type separately for source and non-source cohorts. For the fall semester, error rates are identical among three of the four for the source cohorts (1996-99) with the Cty Only model showing about a 45% greater

error rate. For non-source cohorts (1994-95), three are again identical except for the Global prediction model which shows approximately 30% greater error.

For the summer predictions, as Table 16 clearly shows, the Global prediction model is superior to any other, both for source and non-source cohorts.



**Figure 9**  
Average Error Rates by Source and Non-Source Cohorts

The proceeding suggest that Global prediction techniques are more accurate for summer semesters, but more detailed methods may be more accurate for fall semesters. However, such a conclusion would be fallacious. Figure 9 clearly shows that significant changes in yield rates occur over time among USF's admits (the difference between source and non-source cohorts clearly shows this). Therefore, the best predictor of any year's yield is most probably the preceding year's yield. Using Global techniques, for example, either total cohort, or cohort within Final County or GPA Groupings, it is quite feasible to develop a reliable sample each year to predict the next. These techniques divide the sample into either one or seven groups. Thus, using these techniques, 1999 data may be used to predict 2000

yields. The other, more detailed techniques divide a cohort into 42 different groups, some of which are quite large, others of which are very small and therefore, too unreliable to use for prediction from year to year. Even multiple year data for fall semesters is not adequate for such purposes.

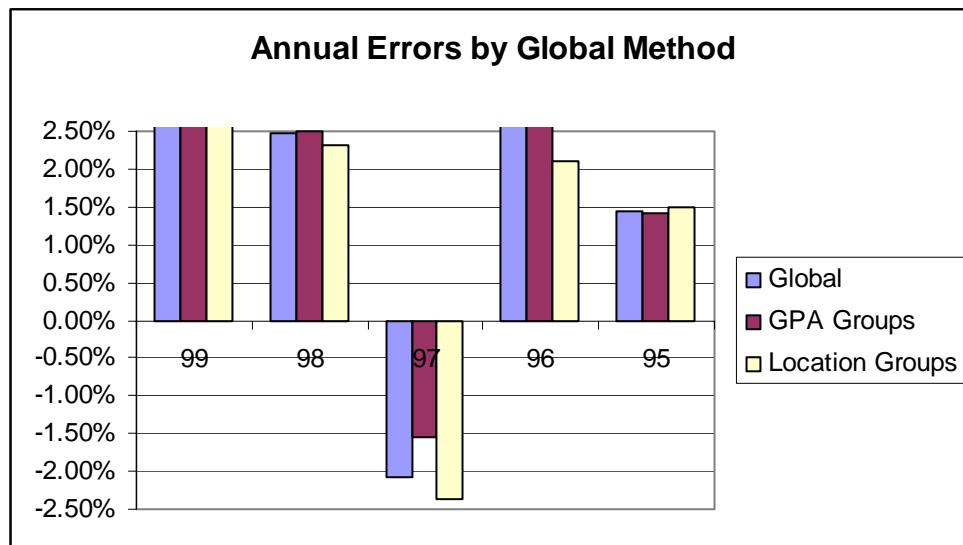
### Testing Global Predictor Error Rates

In an attempt to determine the optimum prediction method (that having the lowest overall error rate in predicting enrollments from admits), three separate yields were computed annually from 1994 to 1999 for both fall and summer:

- Global – The total yield of all enrollees/admits
- Location Groups - Yield of admits within each of the seven final location groups
- GPA Groups - Yield of admits within each of the seven GPA categories (one category additional to the six shown in Table 7 is admits lacking a High School GPA - defined as Missing)

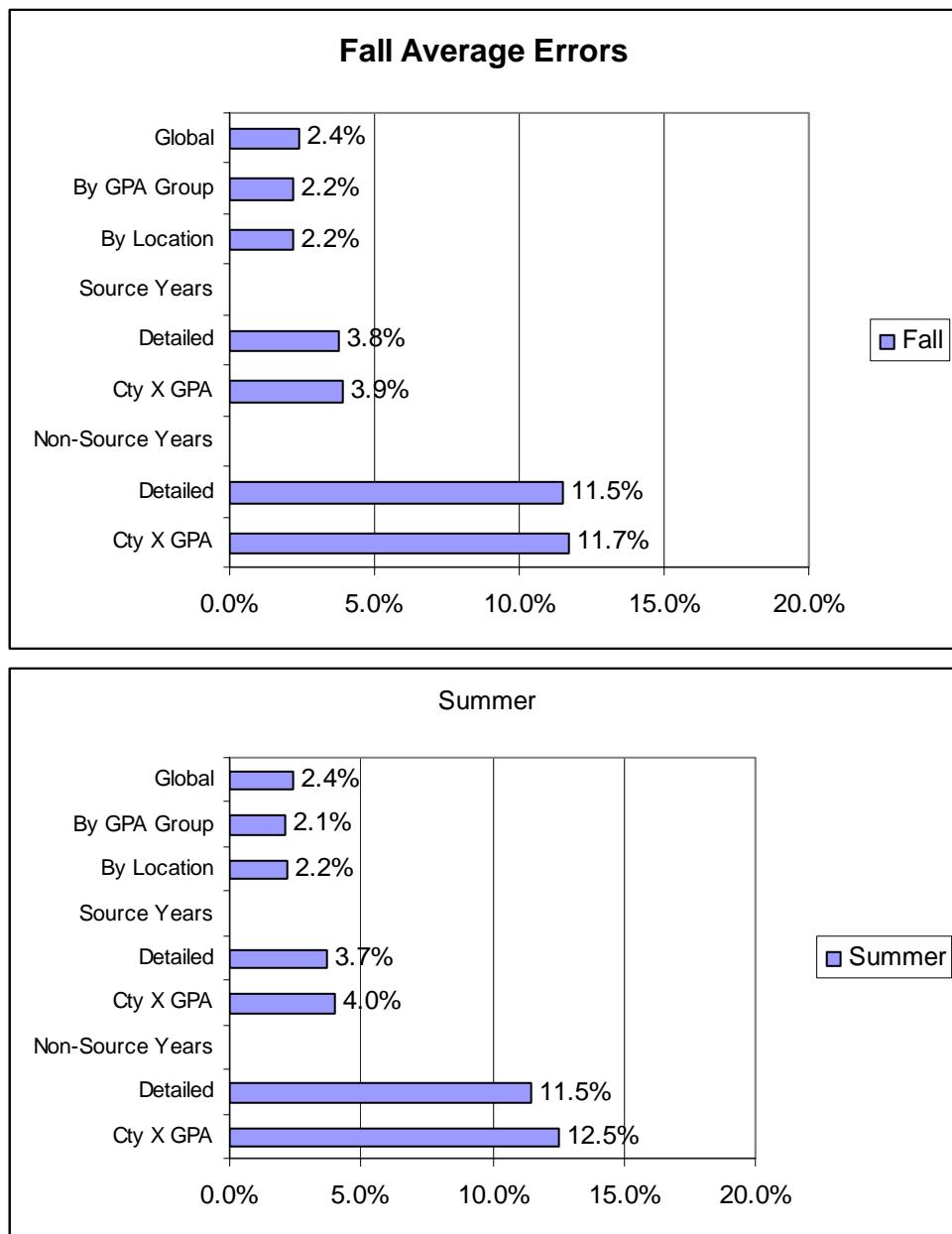
Error rates were computed for each of the categories for each year and combined into total cohort error rates.

Figure 10 shows that the total error rates in predicting the next year's enrollment for each of the three approaches are extraordinarily close. In addition, the maximum error produced by any method was 2.5%. Note that the 1995 results reflect over-prediction, while all four of the other years represent under-prediction.



**Figure 10**  
Annual Error Rates by Year for Three Global Approaches

Figure 11 shows the clear superiority of the three Global prediction techniques over the more specific prediction techniques. Their five year mean error rates were very close to each other (2.2% to 2.4%) and were only about 60% of the detailed error rates for the source years (3.7% to 4.0%), and only about 20% of the detailed error rates for the non-source years (11.5% to 12.5%). Global predictions obviously produce better estimates than specific predictions.

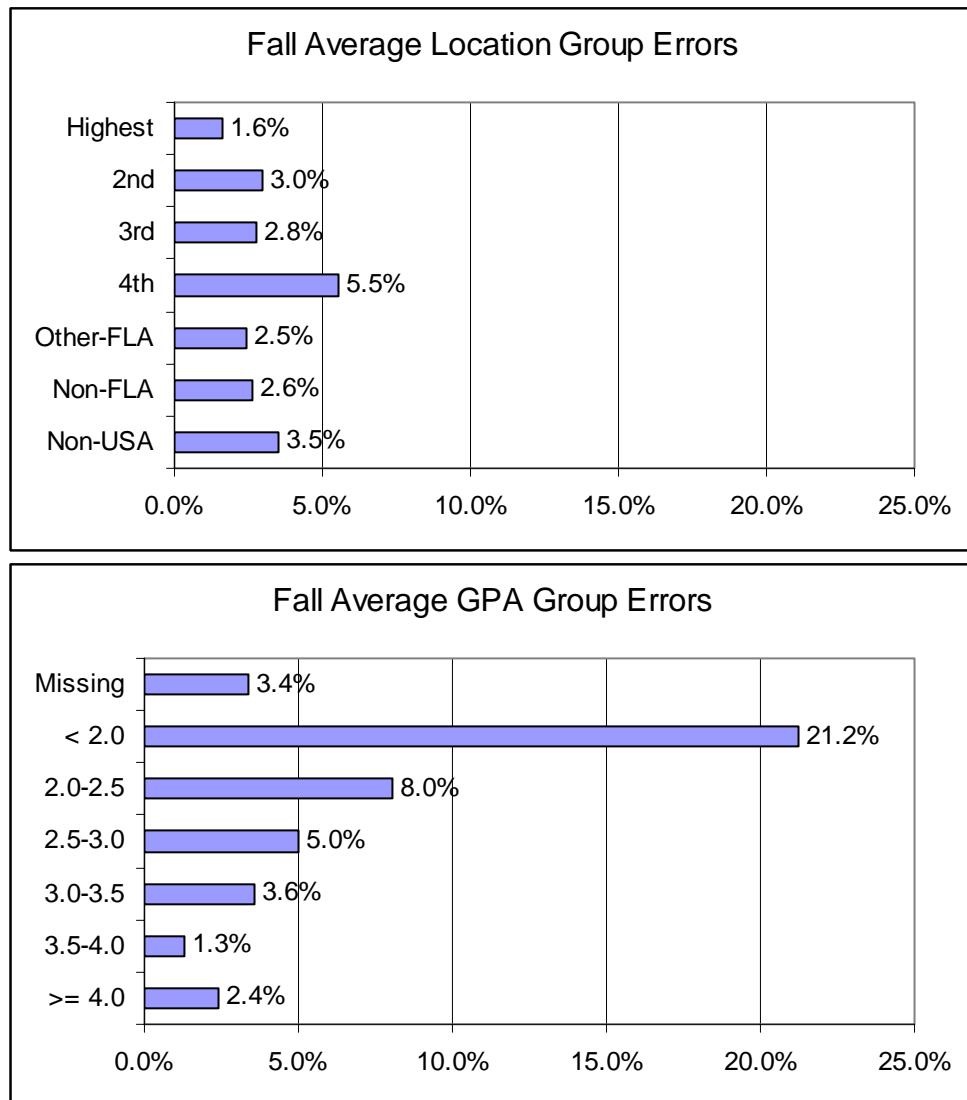


**Figure 11**  
Comparing Multiyear Global and Detailed Error Rates

### An Attempt to Identify an Optimum Prediction Method

The following analyses were conducted in an attempt to determine whether any advantage might be gained by using either the Location or GPA groups rather than the overall Global approach. Obviously, any such advantage would be extremely small (on the order of two-tenths of a percent) and may or may not be worth the effort.

Figure 12 shows that Location Groups exhibit less variability than GPA groups, with all average error rates falling at or below 3.0% except for the 4<sup>th</sup> county group (Brevard, Lee and Collier counties). The bottom panel shows that five of the seven GPA groups exhibit greater error rates than all except the 4<sup>th</sup> Location group. However, it should be noted here that these average error rates are based on absolute values. Thus, a negative 4% and a positive 3% average to 3.5%, whereas, when predicting overall cohort size, these would offset each other. If the number of cases in the two groups having -4% and +3% were equal, this would produce an overall error of -1%, not 3.5%, in predicting the cohort size. The purpose of these analyses is to examining variability, since overall prediction efficacy of all three global methods differs by only two-tenths of a percent (Figure 10).



**Figure 12**  
Multi-year Average Error Rates Within Categories

Figure 13 again shows that the GPA group error rates vary considerably more than those of the Location groups. The lines linking the most variable of the groups are exploded to make them more obvious. For the GPA groups, these groups are respectively, students below a 2.0 and students between 2.0 and 2.5. For the Location groups, the 2<sup>nd</sup> group shows the most year to year variability in prediction error.



**Figure 13**  
Annual Error Rates Within Categories

## Conclusions and Recommendations

The preceding analyses clearly show that Global prediction techniques are far superior to detailed prediction techniques. Another benefit they have is simplicity and smaller chance of error during implementation. The error rates shown by all of the more specific methods were far too large when applied to both Source Data (1996-1999) and non-Source Data (1994-1995). In their best circumstances, they exhibited roughly 1.5 times the error of the Global methods, and in the worst circumstances, approximately 5 times the error.

Any attempt to select among the three Global Approaches tested will produce at best an improvement of some two-tenths of a percent. However, it is clear that the Location group technique is far less variable than the GPA group prediction method. Despite this, the overall cohort prediction errors are almost identical for both summer and fall semesters. It does not appear that a clear "best" method exists. This suggests that any of the three will produce projections of approximately equal accuracy, with an expected error rate of some 2-3%. Appendix A contains the 1999 percentages for all three Global approaches.

### Recommendations

Any projections made using the techniques recommended here must be based on an estimate of future admits. Such estimates may be considerably in error.

It appears that the use of prior year's geographical location may be the most efficient predictive approach due to less variability than GPA groups, which could also be used. The gain over a total cohort method for either of these is about two-tenths of one percent. This gain may not be worth the effort. Appendix A displays the most recent fall and summer semester yields within groups. The most difficult task will be predicting total admits early in the admissions process (before mid March). Once that can be reasonably estimated, a reasonable estimate of fall enrollments becomes possible, subject, of course to the limitations noted below.

Regarding scholarship offerings, these data suggest that 75% of USF's non-service area Florida applicants apply to at least one other SUS institution. Offering desired students from this group scholarships would put us into direct competition with our SUS competitors (see Table 5 for details).

Change current used for weekly admissions projections to use only the most recent year. The current technique uses an average of the most recent three years.

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